7. SITE CONTROL AND SECURITY

Site control and security will be maintained at WAG 7 routine monitoring locations during operational activities to prevent unauthorized personnel from entering the work area. Entry into and exit out of these areas will be controlled through the appropriate use of barriers, signs, and other measures in accordance with PRD-5117.

Based on the nature of the routine monitoring tasks to be completed, a graded approach with two types of site-control designations will be used based on the potential hazards, complexity of work tasks, and duration of sampling events. The two types of work areas are as follows:

- Designated work areas that are established for low-hazard routine monitoring and maintenance tasks at well and lysimeter locations
- Controlled work areas (CWA) that are established for higher-hazard maintenance, decommissioning, and abandonment tasks.

The primary differences between the types of work areas will be the size of the area, method of delineation, and postings as determined by the operations being conducted and associated hazards. The determination of what type of work area will be established will be made by the HSO in conjunction with the FTL and RWMC RADCON personnel (where radiological concerns exist).

Personnel not directly involved with routine monitoring activities will be excluded from entering these work areas. Visitors may be admitted into work areas provided they are (1) on official business, (2) authorized by the FTL, and (3) have met all the site-specific training requirements for the area they have a demonstrated need to access (as listed on Table 4-1).

Note: Visitors may not be allowed into controlled work areas during certain maintenance, decommissioning, or abandonment tasks to minimize risks to workers and visitors. The determination as to any visitor's need for access into the controlled work area will be made by the FTL in consultation with the HSO and RADCON (as appropriate).

Figures 7-1 and 7-2 illustrate examples of a DWA and CWA, respectively. These figures represent the general configuration of the work areas and are not intended to provide an exact layout, position of equipment, or scale. Changing field conditions and industrial hygiene or RADCON monitoring may warrant reconfiguring the layout, size, designation, and orientation of these work areas. Additionally, entrance and egress points may change based on these same factors. Changes, additions, or elimination of areas will be the decision of the FTL in conjunction with the HSO, RADCON (as appropriate), safety professional, and IH based on monitoring data and the nature of the activities taking place.

All potential safety, chemical, and radiological hazards will be evaluated when delineating each work area location and size. Barriers (e.g., rope, cones, and printed ribbon) will be used for delineation and demarcation. Where warranted, designated traffic routes also may be established. These areas also will be posted to prevent inadvertent entry by unauthorized personnel.

Note: The safety professional and IH will assist the HSO in establishing the access requirements for the truck-traffic routes and designated work areas and for the project-based equipment in use.

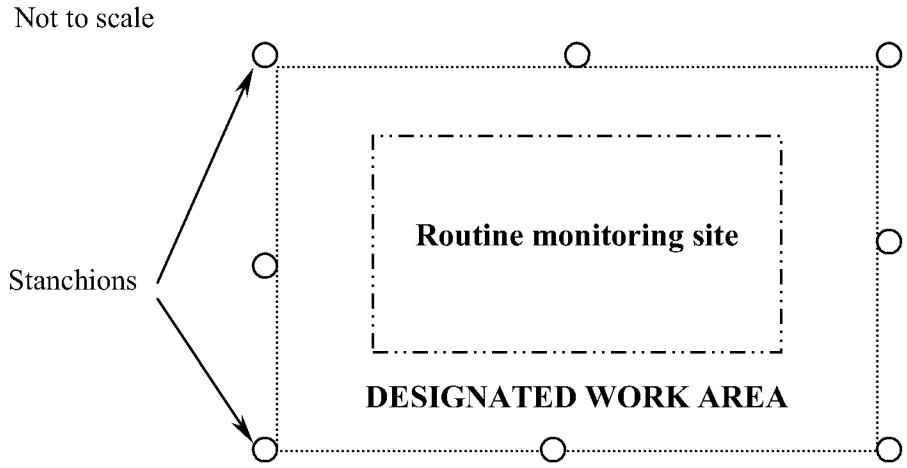

Figure 7-1. Example configuration for a routine monitoring designated work area.

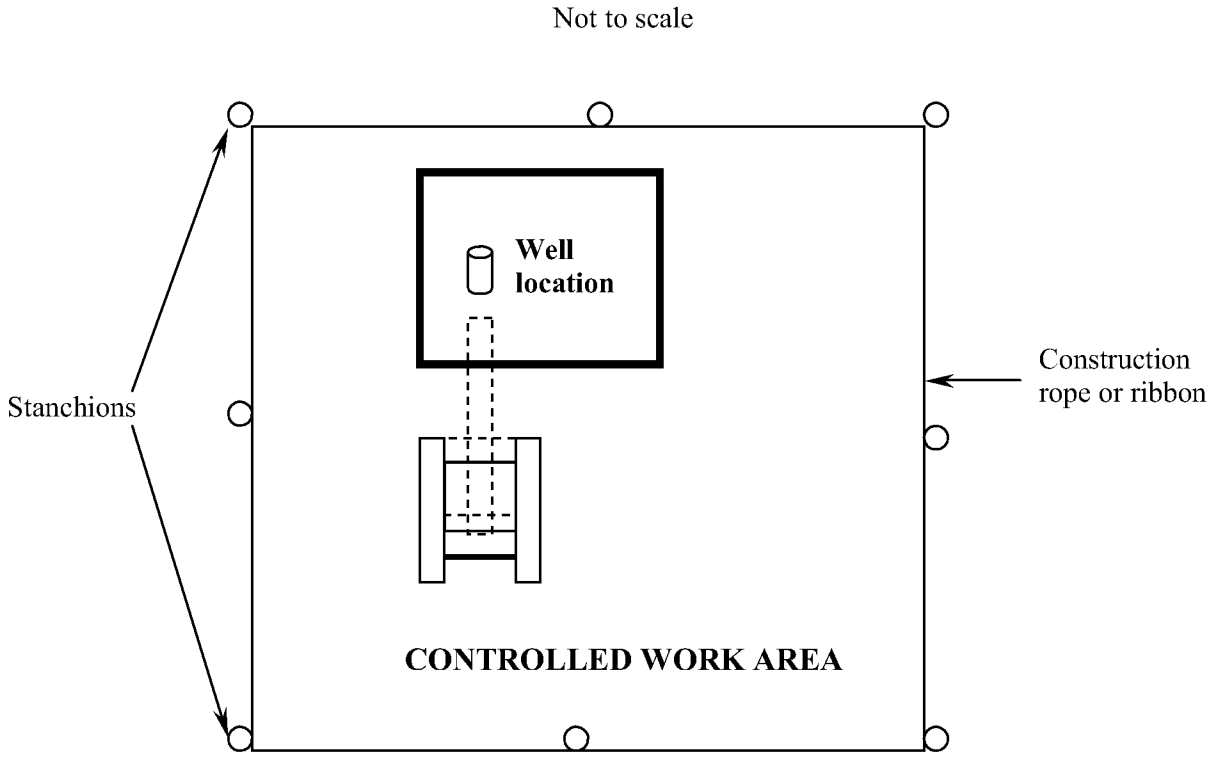

Figure 7-2. Example configuration for a routine monitoring controlled work area.

7.1 Designated Work Area

The DWAs established for routine monitoring tasks will consist of the area immediately around the well being monitored and an area large enough to encompass associated field measurement and sampling equipment. This type of work area will be established where a more restrictive designated work area would not lend itself to low-hazard routine monitoring, measurement, or maintenance tasks of short duration. The DWA boundary will typically be marked with cones or stanchions and generally will not be delineated with rope or ribbon or include other demarcation. All personnel who enter the DWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 9.

Support facilities (e.g., project administrative trailer, vehicle parking, additional emergency equipment, extra PPE, and stored monitoring and sampling equipment) will generally be located outside the designated work area. Visitors who do not have appropriate training to access the designated work area will be restricted from entering this area during routine monitoring operations.

7.2 Controlled Work Area

The CWAs will be large enough to encompass the equipment and nature of the tasks being conducted to prevent personnel not assigned to the project task and visitors from being exposed to potential safety and health hazards associated with the routine monitoring tasks. This type of work area will be established where a more restrictive area is required based on increased hazards associated with routine monitoring maintenance, decommissioning, or abandonment tasks. The boundary of the CWA will typically be marked with a combination of stanchions or posts and delineated with rope or ribbon and include warning signs (e.g., construction area) or other demarcation. Only the minimum number of personnel required to safely perform the project tasks will be allowed into the CWA. The CWA is controlled during all routine monitoring operations and an entry and exit point will be established at the periphery of the CWA to regulate the flow of personnel and equipment. All personnel who enter the CWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 9.

Factors that will be considered when establishing the CWA boundary include (1) air monitoring data, (2) equipment in use, and (3) the physical area necessary to conduct site operations. The boundary may be expanded or contracted, as this information becomes available, based on the aforementioned evaluations. The HSO, in conjunction with the safety professional and IH, will establish the CWAs. All CWAs will be delineated and posted with the appropriate signage based on the hazard being controlled.

7.3 Truck-Traffic Routes

If determined to be required based on project activities, truck-traffic routes may be established for trucks entering the CWA. These routes will include a turnaround area (where feasible) and may be delineated with cones or equivalent markers if an existing roadway does not exist. All drivers will be instructed to use these traffic routes when entering and leaving the CWA, and workers will be restricted from entering this area when truck or equipment traffic is using the routes.

7.4 Site Security

All WAG 7 routine monitoring project sites will be secured and controlled during operational times as described in the previous sections including sites located inside and outside the RWMC facility. During off-hours and weekends, locations inside the RWMC are controlled by the normal RWMC facility security access requirements. Locations outside the RWMC facility generally will not require securing

during nonoperational times unless the site is left in a configuration that continues to be worked (e.g., CWA with heavy equipment left in the area or well components exposed). Under these circumstances, CWA rope boundaries and postings will be left in place during off-hours and weekends to prevent personnel from inadvertently entering the CWA.

The FTL has the primary responsibility for ensuring the CWA is secured. The HSO and RADCON (where required) will ensure that all health and safety and radiological postings of the area are intact when leaving the site and will be responsible for maintaining them for the duration of the project. Personnel are trained on site access and control requirements during project-specific HASP training and will not cross roped areas without the proper training and authorization, regardless of whether a sign is in place or not.

Note: Signs are routinely lost as a result of high winds and will be replaced as soon as possible the next working day following discovery.

7.5 Wash Facilities and Designated Eating Areas

Ingestion of hazardous substances is possible when workers do not practice good personal hygiene habits. It is important to wash hands, face, and other exposed skin thoroughly after completion of work and before smoking, eating, drinking, and chewing gum or tobacco. For project personnel, the WMF-657 field trailer or RWMC WMF-637 cafeteria will serve as the designated eating area. Wash facilities are located in both buildings.

7.6 Designated Smoking Area

Smoking will only be permitted in designated RWMC smoking areas (e.g., areas with a fire extinguisher and smoking receptacle) and personnel will comply with all INEEL smoking polices including disposing of smoking materials in the proper receptacle. Smoking will not be permitted outside the RWMC facility without establishing a designated smoking area. The project safety professional will be the single point of contact for establishing any smoking area outside the RWMC and such areas may not be permitted at certain times of the year because of high or extreme fire danger.

8. HAZARD ASSESSMENT

The overall objectives of this hazard assessment section are to provide guidance on the following:

- Evaluation of all routine monitoring tasks to determine the extent that radiological, chemical, and physical hazards may potentially impact site personnel by all routes of entry
- Establishment of the necessary personnel and area monitoring required to evaluate exposure, determine adequate action levels to mitigate potential exposures, and provide specific actions to be followed if action levels are reached
- Determination of engineering controls, isolation methods, work practices to limit personnel exposure, administrative controls, and appropriate respiratory protection and protective clothing to protect site personnel from hazards.

8.1 Waste Area Group 7 Routine Monitoring Activities

Personnel will be exposed to potential safety and physical hazards and limited chemical and radiological hazards while conducting WAG 7 routine monitoring tasks. The magnitude of these hazards is related to the specific nature of the tasks being conducted, and the relative location of the worker to the potential hazard. In general, well maintenance, decommissioning, and abandonment activities will present greater hazards to personnel than routine sampling tasks. Engineering controls will be implemented (whenever possible) along with work practice controls, use of technical procedures and work orders, real-time monitoring, administrative controls, and site-specific hazard training to further identify and mitigate potential exposures and hazards.

Several tables are presented to identify the potential chemical and radiological concentrations based on past monitoring. Physical hazards that may be encountered, as well as monitoring methods, action limits, and other hazard-specific mitigation measures are also addressed. These tables include the following:

- Table 8-1 lists the radionuclide concentrations from past WAG 7 routine monitoring tasks.
- Table 8-2 lists the chemical constituents and concentrations from past WAG 7 routine monitoring tasks.
- Table 8-3 presents an evaluation of these chemicals and other radiological hazards that likely will be used during routine monitoring tasks with respect to potential routes of exposure, symptoms of overexposure, and the qualitative exposure risk potential based on the chemical nature of these materials and project tasks.
- Table 8-4 summarizes primary routine monitoring tasks, associated hazards, and mitigation.
- Table 8-5 lists the hazards that may be monitored by IHs during routine monitoring activities.
- Table 8-6 lists industrial hygiene equipment available for monitoring chemical hazards.
- Table 8-7 presents action levels and associated responses for specific hazards.

Table 8-1. Radionuclide concentrations from past Waste Area Group 7 routine monitoring tasks.[a]

Radionuclide or Analysis	Release Limit[b]	Average Concentration[c] (pCi/L)	Maximum Concentration[c] (pCi/L)
Gross alpha	15	0.94	4.13 (Well M14S, July1999)
Gross beta	50	4.21	21.3 (Well MD4, March 2000)
Tritium	20,000	579	1,860 (Well M14S, March 2000)

a. Routine monitoring tasks are in accordance with the *Field Sampling Plan for Groundwater Monitoring of Operable Unit 7-13/14* (INEEL 2001b).

b. The value is either an established maximum contaminant level or a proposed maximum contaminant level.

c. Based on all quarterly sampling results from April 1999 to March 2000.

pCi/L = picocurie per liter

Table 8-2. Chemical constituent concentrations from past Waste Area Group 7 routine monitoring tasks.[a]

Chemical	Release Limit[b]	Average Concentration[c] (µg/L)	Maximum Concentration[c] (µg/L)
Chloroform	100	0.3	0.5 (Well M7S, April 1999)
1,1,1-Trichloroethane	200	0.65	2.2 (Well M16S, March 2000)
Carbon tetrachloride	5	3.22	8 (Well M7S, October 1999)
Trichloroethene	5	2	3 (Well M7S, October 1999)
Tetrachloroethene	5	0.2	0.3 (Well M7S, April 1999)
Chromium	100	15.75	28.8 (Well M1S, March 2000)
Mercury	2	ND	ND
Nitrate	10,000	774	774 (Well M6S, October 1999)

a. Routine monitoring tasks are in accordance with the *Field Sampling Plan for Groundwater Monitoring of Operable Unit 7-13/14* (INEEL 2001b).

b. The value is either an established maximum contaminant level or a proposed maximum contaminant level.

c. Based on all quarterly sampling results from April 1999 to March 2000.

Key:
µg/L = microgram per liter ND = none detected

Table 8-3. Evaluation of chemical and radiological hazards at Waste Area Group 7 routine monitoring locations.

Waste Area Group 7 Chemical or Hazardous Material (CAS #)	Exposure Limit[a] (Permissible Exposure Limit or Threshold-Limit Value)	Routes of Exposure	Symptoms of Overexposure[b] (Acute and Chronic)	Target Organs and Systems	Carcinogen (Source)[c]	Exposure Potential[d] (Regardless of Personal Protective Equipment)
Project Chemicals or Compounds Brought to the Site						
Bentonite (sodium bentonite) 7631-86-9	10 mg/m^3 (inert nuisance dust)	Inhalation and contact hazard	Mucous membrane and respiratory tract irritation.	Lungs	No	**Moderate to high potential** (used for well completion)
Silica, crystalline – quartz (cement) (14808-60-7)	TLV - 0. 05 mg/m^3 (respirable fraction) OSHA PEL (Respirable) TWA 10 $mg/m^3/(\%SiO_2 + 2)$ Quartz (total dust): TWA 30 $mg/m^3/(\%SiO_2 + 2)$	Inhalation and contact hazard	Pulmonary fibrosis, silicosis	Respiratory	ACGIH - A2	**Low potential** Used for well completion.
Nitric acid (7697-37-2) Vapor density -2 to 3 11.95 eV	ACGIH 2000 TLV—2 ppm STEL—4 ppm OSHA PEL-TWA—2 ppm	Inhalation, ingestion, and contact hazard	Irritation eyes, skin, mucous membrane; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion	Eyes, skin, respiratory system, teeth	No	**Low potential** Used for water sample preservation. Pipettes will be used to deliver acid to sample container.
Sulfuric acid (7664-93-9)	ACGIH TLV — 1 mg/m^3 STEL— 3 mg/m^3 OSHA PEL-TWA 1 mg/m^3	Inhalation, ingestion, and contact hazard	Irritation eyes, skin, nose, throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatis; dental erosion; eye, skin burns; dermatitis.	Eyes, skin, respiratory system, teeth	ACGIH A2 (as mist)	**Low potential** Used for water sample preservation. Pipettes will be used to deliver acid to sample container.

Table 8-3. (continued).

Waste Area Group 7 Chemical or Hazardous Material (CAS #)	Exposure Limit[a] (Permissible Exposure Limit or Threshold-Limit Value)	Routes of Exposure	Symptoms of Overexposure[b] (Acute and Chronic)	Target Organs and Systems	Carcinogen (Source)[c]	Exposure Potential[d] (Regardless of Personal Protective Equipment)
CO (630-08-0) Portable gasoline or diesel equipment	TLV - 25 ppm OSHA TWA – 50 ppm	Inhalation	Headache, tachypnea, nausea, lassitude (weakness, exhaustion), dizziness, confusion, hallucinations; cyanosis; depressed S-T segment of electrocardiogram, angina, syncope.	Cardiovascular system, lungs, blood, CNS	No	**Low potential** Equipment Will be operated outdoors
Diesel exhaust	TLV- 0.05 mg/m^3 (particulate aerodynamic diameter < 1 µm (ACGIH 2000 notice of intended changes)	Inhalation	Respiratory irritation, nose, throat or lungs, with stinging and redness of the eyes, headache, nausea, dizziness, unconsciousness.	Respiratory system	ACGIH – A2	**Low potential** Equipment will be operated outdoors
Diesel fuel (8008-20-6) VD->1	TLV 100 mg/m^3 (ACGIH 2001 notice of intended changes)	Inhalation, skin absorption, and contact hazard	Eyes irritation, respiratory system changes, dermatitis.	Eye, respiratory system	No	**Low to moderate potential** Will be used to refuel equipment
NO_x (nitrogen oxides) (Incomplete combustion byproduct) – portable operating equipment	TLV – 3 ppm (NO_2) STEL – 5 ppm OSHA C – 5 ppm (NO_2)	Inhalation	Irritation eyes, nose, throat; cough, mucoid frothy sputum, decreased pulmonary function, chronic bronchitis, dyspnea (breathing difficulty); chest pain; pulmonary edema, cyanosis, tachypnea, tachycardia.	Eyes, respiratory system, cardiovascular system	No	**Low potential** Equipment will be operated outdoors

Table 8-3. (continued).

Waste Area Group 7 Chemical or Hazardous Material (CAS #)	Exposure Limit[a] (Permissible Exposure Limit or Threshold-Limit Value)	Routes of Exposure	Symptoms of Overexposure[b] (Acute and Chronic)	Target Organs and Systems	Carcinogen (Source)[c]	Exposure Potential[d] (Regardless of Personal Protective Equipment)
Groundwater Contaminants						
Cadmium (7440-43-9) Vapor density—NA	TLV—0.01 mg/m^3 inhalable fraction TLV—0.002 mg/m^3 respirable fraction PEL—0.005 mg/m^3 (29 CFR 1910.1027)	Inhalation and ingestion hazard	Respiratory, nervous system, irritation of mucous membranes, dryness of mouth, headache.	Kidneys and respiratory tract, blood, prostate	A2—ACGIH Yes—NTP Yes—IARC Yes—OSHA	**Low potential** Trace source term in groundwater samples
Mercury (7439-93-2) VD-1.01	TLV—0.025 mg/m^3	Skin absorption and inhalation hazard	Coughing, chest pain, respiratory distress, salivation, diarrhea, depression, irritability.	Skin, eyes, respiratory central nervous system, kidneys	No	**Low to negligible potential** Trace source term may be encountered in groundwater
Carbon tetrachloride (56-23-5) Vapor density-5.3 Ionization energy-11.5 eV	TLV—5 ppm STEL—10 ppm OSHA ceiling—63 ppm	Inhalation, ingestion, skin absorption, and contact hazard	Nervous system, eyes, respiratory; irritation of eyes and skin, central nervous system, depression, headache.	Central nervous system, eyes, liver, lungs, kidneys	A2—ACGIH Yes—NTP Yes—IARC No—OSHA	**Low potential** Trace source term in groundwater samples
Tetrachloroethene (127-18-4) Vapor density - 5.8 Ionization energy - 9.3 eV	TLV—25 ppm STEL—100 ppm	Inhalation, ingestion, contact hazard	Nervous system, respiratory, headache, loss of consciousness, dermis.	Liver, kidneys, eyes, upper respiratory, central nervous system	No	**Low potential** Trace source term in groundwater samples
1,1,1-Trichloroethane (71-55-6) Vapor density - 4.6 Ionization energy - 11.1 eV	TLV—350 ppm STEL—450 ppm Ceiling—2,460 ppm	Inhalation, ingestion, skin absorption, and contact hazard	Nervous system, dermis, respiratory, eyes, central nervous system depression, headache.	Central nervous system, skin, eyes, cardiovascular system	No	**Low potential** Trace source term in groundwater samples
Trichloroethene (79-01-6) Vapor density - 4.53 Ionization energy - 9.5 eV	TLV—50 ppm STEL—100 ppm Ceiling—537 ppm	Inhalation, ingestion, contact hazard	Nervous system, headache, respiratory, eyes, pulmonary edema.	Respiratory, heart, liver, kidneys, central nervous system	No	**Low potential** Trace source term in groundwater samples

Table 8-3. (continued).

Waste Area Group 7 Chemical or Hazardous Material (CAS #)	Exposure Limit[a] (Permissible Exposure Limit or Threshold-Limit Value)	Routes of Exposure	Symptoms of Overexposure[b] (Acute and Chronic)	Target Organs and Systems	Carcinogen (Source)[c]	Exposure Potential[d] (Regardless of Personal Protective Equipment)
Radionuclides—Gross Alpha, Gross Beta, Tritium						
Radionuclides (whole body exposure)	INEEL— 1.5 rem/year project ALARA dose limit, in accordance with RWP or ALARA task Posting of radiation areas in accordance with INEEL RCM, Table 2-3	Whole body	Electronic dosimetry will be used to alert workers to increased gamma radiation fields. Albedo dosimetry and neutron radiation detection instruments will be used to monitor for neutron radiation.	Blood forming cells, GI tract, and rapidly dividing cells	Yes	**Low to negligible Potential** Trace source term in groundwater samples
Radionuclides (fixed and removable surface contamination)	Posting of CAS# in accordance with INEEL RCM, Table 2-4, § 835.404.c, and § 835.603.f	Ingestion and contact hazard	Alarming personnel contamination monitors and hand-held instruments (see Table 8-6).	GI tract, ionization of internal tissue	Yes	**Low potential** Trace source term in groundwater samples

a. American Conference of Governmental Industrial Hygienists (ACGIH) 2001 TLV Booklet and OSHA 29 CFR 1910 substance-specific standards.

b. Nervous system: dizziness, nausea, and lightheadedness. Dermis: rashes, itching, and redness. Respiratory: respiratory effects. Eyes: tearing and irritation.

c. If yes, identify agency and appropriate designation (ACGIH A1 or A2; NIOSH; OSHA; IARC, NTP).

Key:

ALARA = as low as reasonably achievable
C = ceiling value
CNS = central nervous system
CVS = cardiovascular system
GI = gastrointestinal
IARC = International Agency for Research on Cancer
INEEL = Idaho National Engineering and Environmental Laboratory
NTP = National Toxicology Program
NIOSH = National Institute of Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
PEL = permissible exposure limit
RCM = Companywide Manual 15A, *Radiological Control*
RWP = radiological work permit
STEL = short-term exposure limit
TLV = threshold limit value
TWA time-weighted average
VD = vapor density (Air = 1)

Material safety data sheets for these chemicals are available at the project site.

Table 8-4. Waste Area Group 7 routine monitoring tasks, associated hazards, and mitigation.

Tasks	Potential Hazards and Hazardous Agents	Hazard Elimination, Isolation, or Mitigation
• Site preparation • Groundwater and lysimeter sampling • Groundwater field measurements • Sample preservation • Well surface maintenance and construction • Internal well component maintenance and change out • Well component decommissioning • Well abandonment	1. Contact or exposure to chemicals at the task site—Direct contact with water sample preservation acids, contact with cement (high pH), bentonite, fuels, lubricants, dust, CO and NO_x, and trace metals or chemicals in groundwater. 2. Pinch points, caught-between, struck-by, and overhead hazards—Well-component assembly and placement, vehicle or equipment movement, well construction or abandonment, excavation, crane or boom-truck use, material movement, stacking, or handling. 3. Lifting and back strain—Moving equipment and materials, sampling coolers, pumps, well components, and generators. 4. Tripping hazards, uneven terrain, walking, and working surfaces—Uneven surfaces, wet, muddy, or snow- or ice-covered surfaces, cables, cords, and lines on the ground. 5. Hoisting and rigging—Pulling or positioning pumps and equipment at project site. 6. Heated surfaces, heat, and cold stress—Generator motor and exhaust surfaces, outdoor work, summer and fall temperatures, and PPE usage. 7. Hazards noise levels—Trucks, heavy equipment, compressors, and hand tools. 8. Energy sources—Elevated materials or components; 110 Vac electrical, mechanical, thermal, and potentially compressed air systems.	1. DWA or CWA, MSDS for all chemicals used; PPE to avoid skin contact; acid use in lab hood; CO and NO_x monitoring; IH monitoring, trained fuel handlers, HASP training, and PPE as required. 2. Qualified operators, spotter, backup alarms, DWA, CWA, established truck, traffic lanes (as required), body position awareness, hand, head, body protection, tag lines for hoisting and rigging, work controls. 3. Mechanical lifting and movement devices, proper lifting techniques, two-person lifts (as required); store materials in racks and at waist or chest height (where possible). 4. CWA, identify and mitigate tripping hazards and mark where possible; keep walking and working surfaces clean (where feasible); foot protection entry. 5. CWA, qualified operators, certified rigging, follow PRD-160 requirements, tag lines, and wind restrictions. 6. CWA and restricted areas, identify and communicate known heated surfaces where contact is possible; industrial hygiene monitoring and work-rest or warm-up cycles (as required) for heat and cold tress; proper selection of work clothing or PPE; personnel training. 7. CWA, industrial hygiene sound-level monitoring and dosimetry for source identification; hearing protection devices. 8. CWA and restricted areas, posted and labeled sources; hoisting and rigging standard practices (as stated above) training; isolation of energy source (lockout/tagout) for all maintenance, decommissioning, and abandonment activities; outage or subsurface investigation (as required); PPE.

Key:
CWA = controlled work area DWA = designated work area
IH = industrial hygiene MSDS = material safety data sheet PPE = personal protective equipment

Table 8-5. Waste Area Group 7 routine monitoring project hazards to be monitored.

Tasks	Hazards to be Monitored[a]
• Site preparation • Groundwater and lysimeter sampling • Groundwater field measurements • Sample preservation • Well surface maintenance and construction • Internal well component maintenance and change out • Well component decommissioning • Well abandonment	Hazards noise - heavy equipment, trucks, drill rig CO and NO_x –operations with generators or equipment in areas with poor air movement Dust, total nuisance (respirable) – well surface construction, decommissioning, and abandonment tasks (use of bentonite and excavation tasks) Crystalline silica dust (respirable) – well surface construction and abandonment (use of cement) Noise levels[b] –trucks, heavy equipment, compressors, generator, and other equipment as deemed appropriate Organic compounds – contaminants as listed on Table 8-2 and fueling operations and general operations with potential for exposure to organic hydrocarbons, as deemed appropriate Diesel exhaust – in areas with poor ventilation only, as deemed appropriate.

a. Monitoring and sampling will be conducted (as deemed appropriate by project IH personnel) based on specific tasks, site conditions, and professional judgment.

b. Sound-level meter to be used for instantaneous sound levels and to determine hearing protection requirements. Additional noise dosimetry may be conducted, as deemed appropriate, based on the nature of the sound level sources and duration of exposure or project.

Table 8-6. Equipment available for monitoring Waste Area Group 7 routine monitoring project hazards.

Chemical or Radiological Hazard to be Monitored or Sampled	Equipment and Monitoring and Sampling Method [a,b]	
Petroleum hydrocarbons and distillates Nuisance particulates, NOC Crystalline silica (respirable) Diesel exhaust (respirable)	Personal sampling pumps with appropriate media	Petroleum distillate—NIOSH 1550 Particulates, total nuisance (respirable)—NIOSH 0600 Crystalline silica (respirable)—NIOSH 7500 Diesel exhaust—NIOSH 5040
Petroleum hydrocarbons (VOCs)	FID, PID, or equivalent	
CO, NO_2	MSA-361 or equivalent, with CO and NO_2 cells	
Hazardous noise levels (> 85 dBA for an 8-hour workday, 84 dBA for a 10-hour day, > 140-dBA impact)	ANSI Type S2A sound level meter and ANSI S1.25-1991 dosimeter (A-weighted scale for TWA dosimetry, C-weighted for impact dominant sound environments)	
Heat and cold stress	Heat stress—WBGT, body weight, fluid intake	Cold stress—ambient air temperature, wind chill charts

a. Air sampling will be conducted as deemed appropriate by project IH personnel based on initial direct reading instrument data, routine monitoring operation, and professional judgment.
b. Analytical method will be selected by the IH based on site-specific conditions.

Key:
ANSI = American National Standards Institute
dBA = decibel A-weighted
NIOSH = National Institute of Occupational Safety and Health
NO_2 = nitrogen dioxide
TWA = time-weighted average
WBGT = wet bulb globe temperature
CO = carbon monoxide
FID = flame ionization detector
NOC = not otherwise classified
PID = photoionization detector
VOC = volatile organic compound

Table 8-7. Action levels and associated responses for Waste Area Group 7 routine monitoring project hazards.

Contaminant or Agent Monitored	Action Level	Response Taken if Action Level is Exceeded
Nuisance particulates (NOC)	> 10 mg/m^3 (inhalable fraction) > 3 mg/m^3 (respirable fraction)	Move personnel to upwind position of source. Use wetting or misting methods to minimize dust and particulate matter. IF wetting or misting methods prove ineffective, THEN abandon area being worked OR don respiratory protection[a] (as directed by IH).
Crystalline silica (respirable)	> 0.05 mg/m^3	Move personnel to upwind position of source. Use wetting or misting methods to minimize dust and particulate matter. IF wetting or misting methods prove ineffective, THEN abandon area being worked OR don respiratory protection[a] (as directed by IH).
CO (in poorly ventilated areas)	15 to 25 ppm in workers' breathing zone	Reposition source, monitor near suspected source for elevated levels, ensure personnel are on upwind side of source, and continue to monitor.
	> 25 ppm sustained for 2 minutes in workers' breathing zone	IF > 25 ppm, identify source and leave area until level dissipates below 25 ppm, THEN continuous monitoring. IF levels cannot be kept below 25 ppm, THEN cease operations and contact maintenance personnel to inspect equipment source.[b]
NO2 (in poorly ventilated areas)	1 to 3 ppm in workers' breathing zone	Reposition source, monitor near suspected source for elevated levels, ensure personnel are on upwind side of source, and continue to monitor.
	> 3 but < 5 ppm sustained for 2 minutes in workers' breathing zone	IF > 3 but < 5 ppm, identify source and leave area until level dissipates below 3 ppm, THEN continue monitoring. IF levels cannot be kept below 3 ppm, THEN reposition source downwind and workers upwind, and contact maintenance personnel to inspect equipment source.[b]
	> 5 ppm sustained for 1 minutes in workers' breathing zone	Move personnel unwind of source, shut down equipment when safe to do so, and contact maintenance personnel to inspect equipment source.[b,c]
Diesel exhaust (as elemental carbon)	Note: Elevated CO and NO_2 concentrations should be used as an indication for elevated diesel exhaust concentrations	IF elevated CO and NO_2 concentrations are indicated, THEN, reposition source, monitor near suspected source for elevated levels, ensure personnel are on upwind side of source, and continue to monitor.
	>0.02 mg/m^3 TWA	IF >0.02 TWA, THEN cease operations and contact maintenance personnel to inspect equipment source.[b]

Table 8-7. (continued).

Contaminant or Agent Monitored	Action Level	Response Taken if Action Level is Exceeded	
Hazardous noise levels	< 85 dBA 8-hour TWA, < 84 dBA 10-hour TWA	No action.	
	85 to 114 dBA	Hearing protection required attenuating to below 85 dBA for an 8-hour TWA or 83 dBA for a 10-hour TWA (based device NRR).	
	(a) > 115 dBA (b) > 40 dBA	(a) Isolate source and evaluate NRR for single device. Double protection, as needed.	(b) Control entry, isolate source. Only approved double protection worn.

a. Respiratory protection will be prescribed by the project IH (see Section 9).

b. All equipment must be secured and left in a safe configuration before leaving area.

c. At no time will personnel continue to work in areas with sustained concentrations of NO_2 above 5 ppm (OSHA ceiling value).

Key:

NOC = not otherwise classified	CO = carbon monoxide	dBA = decibel A-weighted
NRR = noise reduction rating	TWA = time-weighted average	NO_2 = nitrogen dioxide

Safe work permits and JSAs may be used in conjunction with this HASP to address specific routine monitoring hazard mitigation. If used, the SWP will augment this HASP and further detail specialized protective equipment and mitigation measures (e.g., hot work).

8.2 Routes of Exposure

Exposure pathways for potential contaminants that may be encountered during routine monitoring activities are directly related to the source of exposure and associated route(s) of entry. Engineering controls, industrial hygiene monitoring, training, and work controls are all intended to mitigate potential exposures and uptake of contaminants; however, the potential still exists for exposure to contaminants that may be encountered.

Exposure pathways include the following:

- Inhalation of vapors from trace contaminants in water samples, preservation acid vapors, or nuisance or silica containing dusts during well surface construction, decommissioning or abandonment tasks. Inhalation of these sources may lead to signs or symptoms described in Table 8-3 for the specific hazard.

- Skin absorption and contact with preservation acids, cement, bentonite dust, or fuel contact (during refueling tasks). Fuel can be absorbed through unprotected skin. Acids, cement, and bentonite have a corrosive effect on skin, eyes, and mucous membranes resulting in skin irritation or potential absorption through broken skin.

- Ingestion of trace contaminants adsorbed to dust particles or on surfaces resulting in potential uptake of contaminants through the gastrointestinal tract that may result in gastrointestinal (GI) irritation (radionuclides) or deposition to target organs.

- Injection by breaking of the skin while handling equipment or materials or migration through an existing wound resulting in localized irritation, contamination, uptake of soluble contaminants, and deposition of insoluble contaminants.

Monitoring will be conducted to identify sources for potential exposure by all routes or entry and to develop mitigative measures to include engineering controls, hold points, and PPE usage where warranted.

8.3 Environmental and Personnel Monitoring

The potential for exposure to chemical, radiological, physical, and environmental hazards exists from various sources that may be encountered during routine monitoring tasks. Engineering and administrative controls, worker training, and the use of protective equipment will mitigate most of these hazards. Monitoring with direct reading instruments will be conducted where deemed appropriate to provide IH personnel with real-time data to assess the effectiveness of these controls. In addition, designated and controlled work areas will be established to limit access to areas around potential hazards to authorized project personnel only (see Section 7).

8.3.1 Industrial Hygiene Monitoring

Various direct reading instruments and full-period sampling equipment may be used to determine the presence of chemical and physical agents and to access environmental conditions. The frequency and

type of sampling and monitoring will be determined by changing site conditions, direct reading instrument results, observation, and professional judgment.

All full- and partial-period airborne contaminant sampling may be conducted, as deemed appropriate by the project IH, based on direct-reading instrument readings and changing site conditions. If conducted, all air sampling will be done using applicable NIOSH or OSHA methods and in conformance to the INEEL Safety and Health Manuals. Risk assessments for site personnel will be conducted according to MCP-153, "Industrial Hygiene Exposure Assessment."

8.3.2 Industrial Hygiene Instrument and Equipment Calibration

All monitoring instruments will be maintained and calibrated in accordance with the manufacturer's recommendations, existing industrial hygiene protocol, and in conformance to the INEEL Safety and Health Manuals. Direct reading instruments will be calibrated, at a minimum, before daily use, and more frequently as determined by the project IH.

8.3.3 Exposure Action Limits

Action levels have been established to prevent and mitigate potential personnel exposure to chemical and physical hazards during routine monitoring activities. The project HSO, in conjunction with the IH and safety professional, will evaluate activities each day to identify changes in site-specific conditions. If action levels are reached, personnel will take the appropriate actions as listed in Table 8-7.

It is important to understand that the action levels in Table 8-7 are in place to prevent occurrences of established 8-hour time-weighted average (TWA) occupational exposure limits for these chemical compounds from being exceeded. When the associated responses to action levels are followed, an additional safety factor is invoked to further reduce the likelihood that the TWAs will be exceeded. The ceiling value for NO_2 is different from a TWA in that this value should not be exceeded even for short time periods. Therefore, a sustained concentration of NO_2 above 3 ppm measured in the breathing zone of project personnel warrant the immediate actions listed in Table 8-7.

8.4 Physical and Environmental Hazard Evaluation, Control, and Monitoring

The physical and environmental hazards present at this project site, and the methods that will be used to monitor and control them, are described in this section. It is critical that all personnel are aware and understand the scope of work for each task, associated hazards, the equipment to be used, and the controls that are in place to eliminate or mitigate the hazards.

8.4.1 Physical Hazards

The physical hazards encountered while performing tasks at WAG 7 routine monitoring sites pose the most significant hazard to personnel. Section 6 provides general safe-work practices that must be followed at all times. The following sections describe specific industrial safety hazards and procedures to be followed to eliminate or minimize potential hazards to project personnel.

8.4.1.1 Back Strain. Movement of loaded sample coolers, well components, field measurement equipment, generators, compressors, and other support equipment could result in a back injury or strain. Manual material handling will be minimized through task design and use of mechanical or hydraulic lifts whenever possible and positioning of materials at the best working levels at the well locations. All tasks

involving manual lifting will be evaluated by the project IH in accordance with MCP-2692, "Ergonomics Program."

8.4.1.2 Powered Equipment and Tools. All power equipment and tools will be properly maintained and used by qualified individuals according to the manufacturer's specifications. Program requirements document (PRD)-5101, "Portable Equipment and Handheld Power Tools," will be followed for all work performed with powered equipment. All power tools and equipment used outdoors will be ground-fault protected.

8.4.1.3 Heavy Equipment and Moving Machinery. The hazards associated with the operation of heavy equipment include injury to personnel, equipment damage, or property damage. All heavy equipment will be operated in the manner in which it was intended and according to the manufacturer's instructions. Only authorized personnel will be allowed in the vicinity of operating heavy equipment and should maintain visual communication with the operator. All equipment operators will be qualified to operate the equipment being used. Work-site personnel will comply with MCP-2745, "Heavy Industrial Vehicles," and PRD-5123, "Motor Vehicle Safety." Additional safe practices include the following:

- Only qualified operators will operate heavy equipment.
- All heavy equipment will have backup alarms.
- Personnel will maintain a safe distance from operating equipment and will stay alert for equipment movement. Personnel will avoid placing themselves between fixed objects and operating equipment and equipment pinch points and remain outside of the equipment swing and turning radius.
- Walking directly in back of or to the side of heavy equipment without the operator's knowledge is prohibited. All precautions will have been taken before moving heavy equipment.
- While operating heavy equipment in the work area, the equipment operator will maintain communication with a designated person responsible for providing direct voice contact or approved standard hand signals. In addition, all site personnel in the immediate work area will be made aware of the equipment operations.
- Where warranted and established, equipment will use established traffic lanes and access ways and will be stored so as not to endanger personnel at any time.
- Heavy equipment operators will observe safe clearance distances with overhead power lines during movement and operation.

8.4.1.4 Hoisting and Rigging. A crane or boom truck and associated rigging will be required to position equipment, pull pumps, and likely during decommissioning or abandonment tasks. All hoisting and rigging operations will be accomplished in accordance with the DOE-STD-1090-99, "Hoisting and Rigging," MCP-6501, "Hoisting and Rigging Operations," MCP-6502 "Hoisting and Rigging Maintenance," MCP-6503 "Inspection and Testing of Hoisting and Rigging Equipment," MCP-6504 "Hoisting and Rigging Lift Plan Preparation," and MCP-6505 "Hoisting and Rigging Training." Some basic requirements include but are not limited to the following:

- Under no circumstances will personnel be permitted under any suspended load
- Tag lines will be used to control the load (unless they create an additional hazard)

- Contact or positioning of a suspended load by hoisting and rigging personnel will be limited to conditions defined in MCP-6501.

- The swing radius of the load will be cleared and only authorized personnel involved with the lift will be allowed in the CWA during hoisting and rigging tasks

- Crane operators will observe safe clearance distances with overhead power lines during movement and operation.

Depending on the complexity of the lift and determination as to whether it is deemed a critical lift, a lifting sketch or similar rigging plan may be required to be developed for hoisting of particular objects or equipment. Where required, the sketch (or rigging plan) will contain a sketch of the object to be lifted including the lifting points or rigging method, center of gravity, gross weight, and required rigging.

All rigging used will have a current load certification tag (or equivalent) demonstrating operability. All equipment operators will be qualified to operate the specific equipment used. Additionally, for mobile cranes or boom trucks, the operator or designated person will visually inspect items following each day, or before use, if the crane has not been in regular service. These items include but are not limited to the following:

- All control mechanisms for maladjustment interfering with proper operation

- Crane hooks and latches for deformation, cracks, and wear

- Hydraulic systems for proper oil level

- Lines, tanks, valves, pumps, and other parts of air or hydraulic systems for leakage

- Hoist ropes for kinking, crushing, birdcaging, and corrosion

- All anti-two-block, two-block warning, and two-block damage prevention systems for proper operation.

Note: The operator or other designated person will examine deficiencies and determine whether they constitute a safety hazard. If deficiencies are found, they will be reported to the safety professional and hoisting and rigging operations will not proceed until deficiencies are corrected.

8.4.1.5 Electrical Hazards and Energized Systems. Electrical equipment and tools as well as overhead lines may pose shock or electrocution hazards to personnel. Safety-related work practices including inspections will be employed to prevent electric shock or other injuries resulting from direct or indirect electrical contact. If work on energized systems is necessary, these practices will conform to the facility supplemental requirements in PRD-5099, "Electrical Safety," MCP-3650, or MCP-3651 and Parts I through III of NFPA 70E (NFPA 2000).

All electrical work will be reviewed and completed under the appropriate work controls (e.g., work orders, technical procedures or equivalent subcontractor work controls) and only by qualified personnel. Additionally, any generators used at the project sites will be properly wired and grounded, in accordance with PRD-5099 and 29 CFR 1926, Subpart K, "Electrical Safety." Electrical power tools, equipment, and cords are to be inspected for damage before use. If damaged, they should be tagged and removed from service.

8.4.1.6 Personal Protective Equipment. Wearing PPE will reduce a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. Also, PPE can increase the risk of heat stress. Work activities at the task site will be modified, as necessary, to ensure that personnel are able to work safely in the required PPE. Work-site personnel will comply with PRD-5121. Project PPE levels for routine monitoring activities are described in Section 9 and listed in Table 9-1.

8.4.1.7 Decontamination. Decontamination of sampling equipment will be required. Section 10 describes decontamination techniques in detail. Personnel will conduct decontamination tasks in accordance with applicable technical procedures or MCPs and wear prescribed PPE. The FTL will provide direction for all equipment decontamination tasks to ensure their effectiveness.

8.4.1.8 Flammable and Combustible Hazards. Flammable or combustible liquids will be used at the task sites for refueling equipment. Diesel fuel used at the task site for fueling the equipment will be safely stored, handled, and used. Portable motorized equipment (e.g., generators and light plants) will be shut off and allowed to cool down in accordance with the manufacturer's operating instructions before refueling to minimize the potential for a fuel fire.

Only FM/UL-approved flammable liquid containers, labeled with the content, will be used to store fuel. All fuel containers will be stored at least 15 m (50 ft) from any facilities (e.g., trailers) and ignition sources or stored inside an approved flammable storage cabinet. Additional requirements are provided in PRD-308, "Handling and Use of Flammable and Combustible Liquids." Portable fire extinguishers, with a minimum rating of 10A/60BC will be strategically located at the site to combat Class A, B, and C fires.

The accumulation of combustible materials will be strictly controlled at routine monitoring sites. Disposal of combustible materials will be assessed at the end of each shift. Class A combustibles such as trash, cardboard, rags, wood, and plastic will be properly disposed of in metal receptacles at the RWMC and in appropriate waste containers within the SDA.

8.4.1.9 Project Equipment Fire Hazards. Combustible or ignitable materials in contact with or near exhaust manifolds, catalytic converters, or other ignition sources could result in a fire. The INEEL fire department may have to authorize any hot work to be done if the fire danger at the INEEL is deemed high or extreme. The project safety professional will be contacted to initiate a hot work permit. If a hot work permit is issued, a trained fire watch will be assigned. Fire extinguishers will be positioned in the DWA or CWA on or near site equipment that has exhaust heat sources and all equipment capable of generating ignition (or that has the potential to spark). At least one radio will be required when conducting routine monitoring tasks so emergency communications can be established should the fire department or RWMC incident response team need to be summoned. Section 11 details emergency communications.

8.4.2 Environmental Hazards

Environmental hazards will be encountered during routine monitoring activities based on the nature of the work (outside), locations of the wells, and time of year when these tasks will be conducted (year-round). The following sections provide guidelines for environmental hazard mitigation.

8.4.2.1 Heat Stress. Summer temperatures and the use of PPE that prevents the body from cooling could lead to environmental conditions where heat stress could occur. High ambient air temperatures can result in increased body temperature, heat fatigue, heat exhaustion, or heat stroke that can lead to symptoms ranging from physical discomfort, unconsciousness, to death. Personnel must inform the FTL or HSO when experiencing any signs or symptoms of heat stress or observing a fellow worker experiencing them. Heat stress hazards are further described in Table 8-8 and in MCP-2704, "Controlling Exposure to Heat and Cold Stress."

Table 8-8. Heat stress signs and symptoms.

Heat-related Illness	Signs and Symptoms	Emergency Care
Heat rash	Red skin rash and reduced sweating	Keep the skin clean, change all clothing daily, and cover affected areas with powder containing cornstarch or with plain cornstarch.
Heat cramps	Severe muscle cramps, exhaustion, sometimes with dizziness or periods of faintness	Move the patient to a nearby cool place and give the patient half-strength electrolytic fluids. If cramps persist, or if more serious signs develop, seek medical attention.
Heat exhaustion	Rapid, shallow breathing; weak pulse; cold, clammy skin; heavy perspiration; total body weakness; dizziness that sometimes leads to unconsciousness	Move the patient to a nearby cool place. Keep the patient at rest, give the patient half-strength electrolytic fluids, treat for shock, and seek medical attention. DO NOT TRY TO ADMINISTER FLUIDS TO AN UNCONSCIOUS PATIENT.
Heat stroke	Deep, then shallow breathing; rapid, strong pulse, then rapid, weak pulse; dry, hot skin; dilated pupils; loss of consciousness (possible coma); seizures or muscular twitching	Cool the patient rapidly. Treat for shock. If cold packs or ice bags are available, wrap them and place one bag or pack under each armpit, behind each knee, one in the groin, one on each wrist and ankle, and one on each side of the neck. Seek medical attention as rapidly as possible. Monitor the patient's vital signs constantly. DO NOT ADMINISTER FLUIDS OF ANY KIND.

Note: Heat exhaustion and heat stroke are extremely serious conditions that can result in death and should be treated as such. Transport individual immediately to the nearest medical facility.

Monitoring for heat stress conditions will be performed according to MCP-2704. Depending on the ambient weather conditions, work conditions, type of PPE worn, and the physical response of work operations personnel, the IH will inform the FTL and HSO of necessary adjustments to the work and rest cycle. Additionally, physiological monitoring may be conducted to determine whether personnel are replenishing liquids fast enough. A supply of cool drinking water will be provided and consumed only in approved areas. Workers may periodically be interviewed by the IH or HSO to ensure that the controls are effective and that excessive heat exposure is not occurring. Workers will be encouraged to monitor their body signs and to take breaks if symptoms of heat stress occur.

Individuals showing any of the symptoms of heat exhaustion listed in Table 8-8 will (1) stop work, (2) exit work area, (3) be decontaminated (as appropriate), (4) remove protective clothing (as applicable), (5) move to sheltered area to rest, (6) be provided cool drinking water, and (7) be monitored by a medic or cardiopulmonary resuscitation (CPR) and first-aid certified employee.

8.4.2.2 Low Temperatures. Exposure to low temperatures will be a factor during routine monitoring activities. Winter conditions, relatively cool ambient temperatures, and wet or windy conditions increase the potential for cold injury to personnel. The project IH and HSO will be responsible for obtaining meteorological information to determine whether additional cold stress administrative controls are required. The hazards and monitoring of cold stress are discussed in MCP-2704. Additional cold weather hazards from working on snow- or ice-covered surfaces exist during fall or winter months. Slip, fall, and material-handling hazards are increased under these conditions. Every effort must be made

to ensure walking surfaces are kept clear of ice. The FTL or HSO should be notified immediately if slip or fall hazards are noted at routine monitoring sites.

8.4.2.3 Inclement Weather Conditions. Routine monitoring activities take place outdoors year-round and inclement weather is to be expected. Inclement or adverse weather conditions (e.g., sustained strong winds 25 mph or greater, electrical storms, winter storms, and heavy precipitation) may develop that pose a threat to personnel conducting routine monitoring tasks. The FTL will be responsible for checking weather reports and communicating this information to field team members. The FTL in consultation with the HSO will evaluate changing weather conditions and determine whether environmental conditions pose unacceptable hazards to personnel or equipment. If required based on changing inclement weather conditions, the FTL will direct field personnel to secure equipment in a safe configuration and seek shelter (commensurate with the weather conditions).

Note: Wind restrictions governing hoisting and rigging activities are provided in PRD-600.

8.4.2.4 Noise. Personnel working at the task site may be exposed to noise levels that exceed 85 decibel A-weighted (dBA) for an 8-hour time-weighted average (TWA) and 83 dBA for a 10-hour TWA from various pieces of equipment in use. The effects of high sound levels (i.e., noise) may include the following:

- Personnel being startled, distracted, or fatigued
- Physical damage to the ear, pain, and temporary or permanent hearing loss
- Interference with communication that would warn of danger.

Noise measurements (using instruments listed in Table 8-6) will be performed by the IH according to MCP-2719, "Controlling and Monitoring Exposure to Noise," to determine whether personnel are above allowable noise exposure levels. A threshold-limit value (TLV) of 85 dBA TWA will be applied to personnel exposed to noise levels over no more than an 8-hour day. This level is based on a 16-hour recovery period in a low-noise environment. If personnel are required to work longer than 8 hours in a hazardous noise environment, then the TLV will be adjusted to a lower value. The project IH must be consulted regarding modifications to the 85 dBA for an 8-hour TLV and 84 dBA for a 10-hour TWA value.

Personnel whose noise exposure routinely meet or exceed the allowable level will be enrolled in the INEEL OMP or appropriate subcontractor hearing conservation program. Personnel working on jobs that have noise exposures greater than 85 dBA (83 dBA for a 10-hour TWA) will be required to wear hearing protection until noise levels have been evaluated, and will continue to wear the hearing protection as specified by the IH until directed otherwise.

8.4.2.5 Biological Hazards. The WAG 7 routine monitoring sites are located in areas that provide habitat for various rodents, insects, and reptiles. Based on biological studies done at the INEEL, indigenous deer mice have been known to carry the Hantavirus. The Hantavirus may be present in the nesting and fecal matter of deer mice. A potential exists for project personnel to disturb nesting or fecal matter during the course of mobilization and intrusive activities, and from material handling tasks in the weather structure. If such materials are disturbed, they can become airborne and create a potential inhalation pathway for the virus. Also, contact and improper removal of these materials may provide additional inhalation exposure risks.

If suspect rodent nesting or excrement material is encountered, the project IH will be notified immediately, and no attempt will be made to remove or clean the area. Following an evaluation of the area, the IH will provide the necessary guidance for protective equipment, mixing, and application of the disinfecting bleach solution and the proper waste disposal method (see MCP-2750, "Preventing Hantavirus Infection").

Snakes, spiders, ticks, mosquitoes, and insects may also be encountered at the cold test pit sites. Common areas to avoid include material stacking and staging areas, under existing structures (e.g., well surface completion cement pads), under boxes, and other areas that provide shelter for snakes and spiders. Protective clothing will prevent insects from direct contact with personnel; however, repellant may be required during Level D activities. Areas where standing water has accumulated provide breeding grounds for mosquitoes and should be avoided. In cases where large areas of standing water are encountered, it may be necessary to pump the water area dry or add a small concentration of nonhazardous surfactant to the water to break the surface tension (i.e., to interrupt the mosquito hatching phases). Consult with the FTL and project environmental coordinator before adding surfactant to standing water areas.

8.4.2.6 Walking and Working Surfaces. Slip, trip, and fall hazards exist from uneven terrain, protruding rocks, holes, well surface completion configurations, and environmental conditions leading to muddy or wet surfaces and snow and ice-covered walking surfaces. Slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, slips, and falls. Where identified or anticipated, personnel will be made aware of existing tripping hazards during the prejob briefing and mitigation steps will be taken to eliminate or minimize slip hazards. Snow- or ice-covered walking surfaces that present a hazard during routine monitoring tasks will be cleared, or a combination of sand and salt applied. Additionally, personnel will wear appropriate footwear for the conditions anticipated to be encountered.

8.4.2.7 Excavation, Surface Penetrations, and Outages. Excavation tasks may be required in conjunction with well decommissioning or abandonment. Underground utilities will be identified through the use of a subsurface investigation in accordance with PRD-22, "Excavation and Surface Penetration." A competent person will be designated for all excavation tasks. Definitions are provided below.

In accordance with 29 CFR 1926.32, "Definitions," a competent person for excavation activities means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

The competent person will evaluate the excavation process to ensure the proper slope and access requirements are being met and conduct inspections as required by PRD-22. This inspection will include, at a minimum, indications of possible cave-in, water accumulation, failure of any component of protective systems, stability of spoil piles and adjacent structures, and indications of hazardous atmosphere.

Access into any excavation will be limited to authorized personnel only, and only after a competent person has inspected the excavation. If the excavation is adjacent to a roadway, then barricades will be used to prevent vehicles from entering the area around the excavation.

8.4.3 Confined Spaces

No confined spaces have been identified or are anticipated to be encountered during routine monitoring tasks. If a suspected confined space is encountered and not properly posted, it will be treated as a permit-required confined space until a determination is made by an assigned safety or IH professional.

8.5 Other Site Hazards and Inspections

Task-site personnel should continually be alert for potential hazards and immediately inform the FTL or HSO so corrective actions can be taken to eliminate or mitigate the hazard. The HSO and FTL will visually inspect the site to ensure that barriers and signs are being maintained, unsafe conditions are corrected, and debris is not accumulating on the site. These inspections will be conducted in addition to regulatory mandated inspections (as applicable).

Periodic safety inspections will be performed by the FTL (or designee) using an appropriate checklist in accordance with MCP-3449. Additionally, targeted or required self-assessments may be performed in accordance with MCP-8, "Performing Management Assessment and Management Reviews." All inspections and assessments will be noted in the FTL logbook. Health and safety professionals present at the task site may at any time recommend changes in work habits to the FTL; however, all changes that may affect the project's written work control documents (i.e., HASP, JSAs, and SWPs) must have concurrence from the appropriate project technical discipline representative onsite and have a document action request prepared as required.

9. PERSONAL PROTECTIVE EQUIPMENT

Industrial safety hazards are the primary hazards associated with WAG 7 routine monitoring tasks. Anyone entering DWAs or CWAs must be protected against potential safety and contaminant exposure hazards. In addition, personnel who enter DWAs or CWAs must wear, as a minimum, Level D PPE. Based on the sampling data available to date, groundwater chemical and radiological contaminants of concern present only a minimal exposure potential to project personnel. This section addresses required PPE for conducting routine monitoring tasks and contingencies for upgrading PPE if required.

The purpose of PPE is to shield or isolate personnel from chemical, safety, and physical hazards that cannot be eliminated through engineering or other controls. It is important to realize that no PPE ensemble can protect against all hazards under all conditions and that work practices and adequate training will also provide a greater level of protection to workers.

Selection of the proper PPE to protect project site personnel is based on the following:

- Routine monitoring of project tasks to be conducted (e.g., well sampling, field measurements, maintenance, decommissioning, and abandonment)
- Expected chemical and radionuclides that may be encountered
- Potential contaminant routes of entry
- Physical form and chemical characteristics of contaminants
- Acute and chronic effects from exposure to chemicals and radionuclides
- Local and systemic toxicity
- Anticipated exposure levels (e.g., contact and airborne)
- Hazard analysis evaluation (see Section 8).

The PPE is generally divided into two broad categories: (1) respiratory protective equipment and (2) personal protective clothing. Both of these categories are incorporated into the standard four levels of protection (Levels A, B, C, and D). Table 9-1 provides guidance in the selection process for respiratory and protective clothing. Each of the major routine monitoring tasks have been evaluated based on the site-specific hazards and the most appropriate PPE level (including modifications) has been determined. Task-based respiratory protection and the protective clothing required for WAG 7 routine monitoring tasks are listed in Table 9-1.

9.1 Respiratory Protection

Based on the tasks to be completed, the quantity and form of potential hazardous constituents and engineering controls that will be implemented, respiratory protection is not anticipated to be required for routine monitoring tasks. Therefore, respiratory protection will be made available only as a contingency if action limits are exceeded, or site conditions change such that additional respiratory protection is required (i.e., upgraded). If respiratory protection is required, assigned protection factors for respiratory devices will not be exceeded.

Table 9-1. Waste Area Group 7 routine monitoring project task-based personal protective equipment requirements and modifications.

Task	Level of Personal Protective Equipment	Category: Primary or Contingency	Modifications and Comments
All Waste Area Group 7 Routine Monitoring Activities			
• Site preparation • Groundwater and lysimeter sampling • Groundwater field measurements	Level D	Primary	Level D PPE as defined in Section 11.2. Modification for specific hand protection for material-handling and sampling tasks will be defined by the industrial hygienist.
• Sample preservation • Well surface maintenance and construction • Internal well component maintenance and change out • Well component decommissioning • Well abandonment	Modified Level D	Upgrade contingency	Upgrading to modified Level D (e.g., protective clothing, Tyvek coveralls or equivalent) may be required if action levels are exceeded or contact with cement or bentonite material cannot be avoided (i.e., prolonged and extensive skin contact).
	Level C	Upgrade contingency	If airborne contaminants increase to concentrations above established action limits, Level C full face piece air-purifying respiratory protection will be worn in conjunction with chemical protective clothing (cartridge to be selected by the project industrial hygienist based on airborne hazard).

If required, all personnel required to wear respirators will complete training and be fit-tested before being assigned a respirator in accordance with the training and documentation requirements of this HASP. Requirements for respirator use (i.e., emergency use, storage, cleaning, and maintenance), as stated in the MCP-2726, "Respiratory Protection," will be followed.

9.2 Personal Protective Equipment Levels

The following sections provide detail and explanation of the four levels of PPE. Modifications to these levels will be made under the direction of the HSO in consultation with the project IH and safety professional as appropriate. Such modifications are routinely employed during HAZWOPER activities to maximize efficiency and to meet site-specific needs without compromising personnel safety and health.

Table 9-1 lists each task or assignment and the corresponding PPE level as well as any additional or special items necessary for personal protection at the task site. The HSO, IH, and safety professional will determine what modifications to the PPE levels listed in Table 9-1 are appropriate.

9.2.1 Level D and Modified Level D Personal Protective Equipment

Level D or modified Level D PPE will serve as the primary PPE level for all routine monitoring tasks. Level D PPE will only be selected as a work uniform and not on a site with respiratory or skin absorption hazards requiring whole-body protection. Level D or modified Level D PPE provides no protection against airborne chemical hazards, but rather is used for protection against nuisance contamination and physical hazards. Level D PPE will only be allowed in areas that have been characterized as such or are known to never have been contaminated. The Level D PPE ensemble may be modified by the IH or RCT to provide protection from skin or other physical hazards, but will not include the addition of respiratory protection.

Level D PPE consists of the following:

- Coveralls or standard work clothes (as determined by the IH and safety professional)
- Hard hat
- Eye protection and safety glasses with side shields as a minimum (see PRD-5121)
- Hand protection for all material handling tasks (e.g., leather for material handling tasks and nitrile or equivalent sampling and acid-handling tasks as specified by the IH)
- Safety footwear (e.g., steel or protective toe and shank as determined by the safety professional)
- Optional Level D modifications consisting of the following:
    - Chemical protective clothing (i.e., Tyvek and Saranex) as prescribed by project IH
    - Chemically resistant hand and foot protection (e.g., inner and outer gloves and boot liners)
    - Any specialized protective equipment (e.g., hearing protection, face shields, welding goggles, and aprons)
    - Chemical goggles for cement or bentonite mixing operations.

9.2.2 Level C Personal Protective Equipment

Level C PPE will only be worn if the airborne action levels to airborne chemical levels (or other constituents) are exceeded and cannot be controlled. Additionally, task site chemical contaminants must be well characterized indicating that (1) personnel are protected from airborne exposures by wearing air-purifying respirators with the appropriate cartridges, (2) no oxygen-deficient environments exist (< 19.5% at sea level), and (3) that there are no conditions that pose immediate danger to life or health. Basic Level C PPE will include the Level D ensemble with the following respiratory and whole body protection upgrades:

- Full-face air-purifying respirators equipped with a NIOSH-approved cartridge (the IH to specify type of cartridge [e.g., organic vapor, high-efficiency particulate air filter, or combination])

- Chemical-resistant coveralls (i.e., Tyvek QC, Tychem 7500, and Saranex-23-P), as prescribed by project IH
- Chemical-resistant outer shoe or boot cover (the IH to specify material)
- Inner chemical-resistant nitrile rubber gloves with cotton liners (as determined by the IH)
- Outer chemical-resistant Viton or polyvinyl alcohol gloves (as determined by the IH)
- Optional Level C modifications (any specialized protective equipment [e.g., hearing protection, welding lens, and aprons]).

9.3 Protective Clothing Upgrading and Downgrading

The project HSO in consultation with the project IH and safety professional will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading of PPE requirements based on current conditions is a normal occurrence. If changing conditions are encountered, new work control documents (e.g., SWP and JSA) may need to be written or updated to reflect these changes. Additional reasons for upgrading or downgrading include:

- Upgrading criteria or conditions (work will stop immediately if an upgrade in PPE is required)
  - Unstable or unpredictable site hazards (chemical or other)
  - Contaminants that present difficulty in monitoring or detecting
  - Known or suspected presence of skin absorption hazards
  - Temporary loss or failure of any engineering controls
  - Identified source or potential source of respiratory hazard(s)
  - Change in the task procedure that may result in increased contact with contaminants, or a change in the requirements for meeting any of the criteria listed above.
- Downgrading criteria
  - New information of monitoring data that shows the contaminant levels to be lower than established action limits
  - Implementation of new engineering or administrative controls that eliminate or significantly mitigate hazards
  - Elimination of potential skin absorption or contact hazards
  - Change in site conditions that results in removal of physical hazards or reduces or isolates them to a controlled area
  - Completion or change in tasks that results in the elimination of key hazards that require higher levels of PPE.

9.4 Inspection of Personal Protective Equipment

All PPE ensemble components must be inspected before use and when in use within routine monitoring DWAs or CWAs. Once PPE is donned, self-inspection and the use of the buddy system will serve as the principal forms of inspection. If at any time PPE should become damaged or unserviceable, an individual will inform others of the problem and proceed directly to the controlled work area exit point to doff and replace the equipment. Additionally, all PPE that becomes grossly contaminated with grout will be cleaned or replaced. Table 9-2 provides an inspection checklist for common PPE items.

Table 9-2. Personal protective equipment inspection checklist.

Personal Protective Equipment Item	Inspection
Gloves	Before use: • Pressurize gloves to check for pinholes. To pressurize: blow in the glove then roll until air is trapped and inspect. No air should escape. Inspect leather gloves for tears, excessive wear, or deterioration or permeation. While wearing in the DWA or CWA: • Inspect for tears, punctures, and damage. Replace if unserviceable.
Modified Level D and C clothing	Before use: • Visually inspect for imperfect seams, nonuniform coatings, and tears. Hold PPE up to the light and inspect for pinholes, deterioration, stiffness, and cracks. Check cloth coveralls for tears and rips and deterioration. While wearing in the DWA or CWA: • Evidence of chemical attack, such as discoloration, swelling, softening and material degradation. Inspect for tears, punctures, and zipper or seam damage. Check all taped areas to ensure they are still intact.
Respirators (if required) (full-face piece, air-purifying)	Before use: • Check condition of the face piece, head straps, valves, connecting lines, fittings, and all connections for tightness. • Check cartridge to ensure proper type or combination for atmospheric hazards to be encountered. Inspect threads and O-rings for pliability, deterioration, and distortion.

CWA – controlled work area DWA – designated work area PPE – personal protective equipment

10. DECONTAMINATION PROCEDURES

No decontamination beyond these normal sampling equipment procedures is anticipated. Typical doffing of protective clothing (if required) is anticipated during WAG 7 routine monitoring activities. If contact with potentially contaminated surfaces cannot be avoided, then additional engineering controls in combination with PPE upgrades may be necessary to control the contact hazard; however, if chemical or radiological contamination is encountered at levels requiring decontamination, this section provides guidance on how it will be conducted.

10.1 Contamination Control and Prevention

Contamination control and prevention procedures will be implemented to minimize personnel contact with contaminated surfaces if such surfaces are encountered and contacted during routine monitoring activities. The following contamination control and prevention measures will be employed if contamination is encountered:

- Identification of potential sources of contamination; design containment, isolation, and engineering controls to eliminate or mitigate any potential for contact or release of contaminants
- Limitation of the number of personnel, equipment, and materials that enter the contaminated area
- Implementation of immediate decontamination procedures to prevent the spread of contamination (if contamination is found on the outer surfaces of equipment)
- Utilization of only the established control entry and exit point from the contaminated area to minimize the potential for cross-contamination and expedite contamination control surveys
- Wearing of disposable outer garments and utilization of disposable equipment (where possible)
- Using hold points within procedures and work orders to monitor for contamination where anticipated.

10.2 Equipment and Personnel Decontamination

Decontamination procedures for personnel and equipment are not anticipated to be required beyond normal PPE change out and technical procedures for sampling equipment cleaning.

10.2.1 Equipment Decontamination

Decontamination of sampling equipment will be conducted in accordance with GDE-140, "Decontaminating Sampling Equipment." If contact with potentially contaminated surfaces cannot be avoided, then additional engineering controls in combination with PPE upgrades may be necessary to control the contact hazard. Equipment will be decontaminated based on the source of contamination.

If radionuclide decontamination operations are required for equipment or areas, they will be performed in accordance with Chapter 4 of the radiological control manual (PRD-183). Nonradionuclide decontamination will be evaluated on a case-by-case basis by the HSO and project IH to determine the most appropriate PPE (Level C protective clothing will initially be selected if airborne contaminants may be generated until site monitoring can demonstrate downgrading is warranted). Specific personnel and equipment decontamination methods are provided below.

10.2.2 Personnel Decontamination

The WAG 7 routine monitoring activities will be conducted in Level D PPE unless upgrading is warranted. Engineering controls in conjunction with work controls and proper handling of groundwater samples will serve as the primary means to eliminate the need for personnel decontamination. If modified Level D protective clothing is required, all items will be inspected following the list in Table 9-2.

10.2.3 Decontamination in Medical Emergencies

If a person is injured or becomes ill, he or she will immediately be evaluated by first-aid trained personnel at the project task site (on a voluntary basis). If the medical condition is serious, the FTL will contact the RWMC sift supervisor (or Warning Communications Center [WCC] if the RWMC shift supervisor cannot be reached) to summon emergency services (fire department and CFA medical) to the site.

Medical care for serious injury or illness will not be delayed for decontamination. In such cases gross contamination may be conducted by removing the injured person's outer protective clothing (if possible) and other contaminated areas contained with a bag or glove. If contaminated PPE cannot be removed without causing further injury (except for the respirator which must be removed), the individual will be wrapped in plastic, blankets, or other available material to help prevent contamination of the inside of the ambulance, medical equipment, and medical personnel.

The IH or RCT (depending on the type of contamination) will accompany the employee to the medical facility to provide information and decontamination assistance to medical personnel. Contaminated PPE will then be removed at the CFA medical facility and carefully handled to prevent the spread of contamination. Chapter 5 of Companywide Manual 15B, *Radiation Protection Procedures,* and MCP-148, "Personnel Decontamination," contains information on proper handling of radionuclide-contaminated wounds.

10.3 Doffing Personal Protective Equipment and Decontamination

As stated earlier, no personnel decontamination beyond doffing of PPE is anticipated for this project. Careful removal of the outer PPE will serve as the primary decontamination method.

The specific doffing sequence of modified Level D or C PPE, and associated decontamination procedures, will be based on the nature of the contamination. A general approach for doffing modified Level D or C PPE is described below; however, there is no single doffing strategy that works for all circumstances. Modifications to this approach are appropriate if site conditions change or at the discretion of the project HSO in consultation with the project IH and RCT.

10.3.1 Modified Level D Personal Protective Equipment Doffing and Decontamination (If Required)

If required to be worn, modified Level D protective clothing (e.g., disposable coveralls) will be doffed following standard removal techniques (rolling outside surface inward and down) and will constitute the initial decontamination step. All PPE will be placed in the appropriately labeled containers.

10.3.2 Level C Personal Protective Equipment Doffing and Decontamination (If Required)

If respiratory protection is worn in conjunction with protective clothing (e.g., Level C PPE), then the modified Level D sequence will be followed with one additional step. That additional step is to remove the respirator and place it in a separate container from the discarded protective clothing. Depending on the type of contamination encountered, this step will be followed by a radiological survey or IH evaluation.

10.4 Disposal of Contaminated Personal Protective Equipment and Equipment

10.4.1 Storage and Disposal of Investigative Derived Waste Materials

Waste also will include PPE and miscellaneous sampling materials (e.g., paper towels, plastic bags, and gloves). Based on previous sampling at the RWMC wells, it is not anticipated that any miscellaneous sampling materials will become contaminated. If contaminated, the waste will be bagged, secured with duct tape, and labeled in accordance with instructions from the RCT. The waste can be stored in the WAG 7 CERCLA cargo container pending laboratory analyses if necessary. It is expected that the waste will be handled as conditional industrial waste to comply with the waste disposal and disposition form. Free release surveys of suspected radiologically contaminated waste would be conducted in compliance with MCP-425, "Radiological Release Surveys, and the Disposition of Contaminated Materials."

Cold (nonradiological) waste is sent to the CFA landfill or another INEEL-designated solid-waste landfill. Low-level radioactive waste is stored in the WAG 7 CERCLA cargo container in the radioactive material area in accordance with MCP-3475, "Temporary Storage of CERCLA-Generated Waste at the INEEL." The waste will be evaluated for additional characterization and managed as low-level waste. Final disposition will be coordinated with Waste Generator Services.

10.4.2 Site Sanitation and Waste Minimization

Site personnel will use the portable toilet facilities provided in the RWMC WMF-657 or other RWMC area. Potable water and soap is available in these areas for personnel to wash their hands and face upon exiting the DWA or CWA.

Waste materials will not be allowed to accumulate at routine monitoring sites. Appropriately labeled containers for industrial waste and CERCLA waste (as required) will be maintained at the project site, as stated in the *Field Sampling Plan for Groundwater Monitoring of Operable Unit 7-13/14* (INEEL 2001b). Personnel should make every attempt to minimize waste through the judicious use of consumable materials. All site personnel are expected to make good housekeeping a priority at the job site.

11. EMERGENCY RESPONSE PLAN

This section defines the responsibilities for the project and the INEEL emergency response organization (ERO) by providing guidance for responding to abnormal events during project activity.

This emergency response plan addresses OSHA emergency response activities as defined by 29 CFR 1910.120/1926.65, and DOE emergencies as defined by DOE Order 151.1A, Change 2, "Comprehensive Emergency Management System," and DOE Order 232.1A, "Occurrence Reporting and Processing of Operations Information." This response plan is implemented in concert with PLN-114, *INEEL Emergency Plan/Resource Conservation and Recovery Act (RCRA) Contingency Plan*.

The INEEL Emergency Plan/RCRA Contingency Plan (PLN-114) may be activated in response to events occurring at the RWMC or at the INEEL, or at the discretion of the emergency coordinator (EC) or emergency action manager. Once the INEEL plan is activated, project personnel will follow the direction and guidance communicated by the EC.

Note: The OSHA term emergency is not defined the same as an emergency as classified by DOE Orders 151.1, Change 2, and 232.1. For this reason, the term event will be used in this section when referring to project HAZWOPER emergencies.

Emergency response plans must be developed and put into place before any project activity begins. Preplanning makes it possible for the project to anticipate and appropriately respond to abnormal events that can affect project activity. Preplanning also ensures that the project emergency response program is integrated with that of the INEEL and RWMC.

All emergencies will be reported through the RWMC shift supervisor to the ERO for classification in accordance with Section 4 of PLN-114. If the RWMC ERO is activated, site emergency response will follow the PLN-114, Addendum 3.

On-scene response to and mitigation of site emergencies could require the expertise of both INEEL personnel and INEEL fire department personnel. Emergencies that could occur include:

- Accidents resulting in injury
- Fires
- Spills of hazardous or radiological materials
- Tornadoes, earthquakes, and other adverse natural phenomena
- Vehicle or transportation emergencies
- Safeguard and security emergencies
- Emergencies at nearby facilities that could prompt evacuation or take-cover actions at the task site.

11.1 Types of Emergency Events

11.1.1 Events Requiring Emergency Notifications

Certain events require courtesy notifications but do not require a response from the INEEL ERO. In these cases, the project FTL or designee will immediately notify the RWMC shift supervisor or WCC if the shift supervisor cannot be contacted. Notification of the FTL should describe the event and state that no emergency response support is required. Examples of these types of events include but are not limited to the following:

- Personal injury at the site requiring medical evaluation or first aid treatment but not requiring an ambulance response
- Equipment or vehicle accident that results in damage to the vehicle or property ONLY
- Small fire that is immediately extinguished with a hand-held fire extinguisher (also requires notification to the INEEL fire department)
- Any other event deemed potentially reportable.

11.1.2 Events Requiring Local Project Evacuation or Idaho National Engineering and Environmental Laboratory Emergency Response Organization Response

Some events that could occur at the project site or at the RWMC may require support from the INEEL ERO or may require a local area evacuation of the project. In these cases, the project FTL will immediately notify the RWMC shift supervisor. If the shift supervisor cannot be contacted immediately, then the WCC will be contacted. Notification of the FTL will describe the event and will request emergency response resources as appropriate. After being informed of the event, the RWMC EC may elect to activate the command post (CP). Once the CP is operational, all emergency response activities will be coordinated through the EC. The specific actions to be taken in response to emergency alarms are described in Section 11.3. Examples of these types of events include but are not limited to those listed below:

- Fire that is burning beyond an incipient stage and cannot be extinguished with hand-held extinguishers
- A large spill at the project that cannot be immediately contained or controlled
- Serious injury to a worker or workers.

A positive sweep of the site being worked will be done by the HSO and FTL before evacuating the site for accountability purposes.

Note: When the project site has been evacuated, the FTL will serve as the project area warden and ensure the RWMC shift supervisor or EC (if CP is formed) notification is made that project personnel have been evacuated and accounted for.

11.1.3 Events Requiring Total Facility and Project Evacuation

In the event of an RWMC or INEEL site facility evacuation, the FTL will verbally notify all project personnel to evacuate by using the radio or by using the local evacuation signal. The RWMC notification may be via RWMC alarms or other communication (e.g., radio) as initiated by the EC for

protective actions. For accountability purposes, a positive sweep of the site will be done by the FTL before evacuating the site.

Note: When an evacuation is called for by the EC, the FTL will serve as the project area warden and ensure RWMC shift supervisor and EC (if CP is formed) notification is made that project personnel have been evacuated and accounted for.

11.2 Emergency Facilities and Equipment

Emergency response equipment maintained at the site or available at the routine monitoring site includes the items described in Table 11-1. Addendum 3 to PLN-114 lists emergency equipment available at the RWMC. This includes the CP located in Building WMF-637, equipment located in Building WMF-601 (i.e., self-contained breathing apparatus, dosimeters, air samplers, decontamination and first-aid equipment, and an emergency response trailer). The INEEL fire department maintains an emergency hazardous material (HAZMAT) response van that can be used to respond to an event or emergency at the project. Fire department personnel are also trained to provide immediate hazardous material spills and medical services. At least one person with current medic and first-aid training will be present at the project to render first aid on a voluntary basis.

Table 11-1. Emergency response equipment to be maintained at the site during operations.

Equipment Name and Quantity Required	Location at Task Site	Responsible Person	Frequency of Inspection or Verification[a]
First-aid kit	Project vehicle or near DWA or CWA	HSO	Monthly–check seal only
Eyewash bottles[b] Eyewash station[b]	In or near DWA or CWA	HSO	Monthly
Hazardous materials spill kit	Project vehicle	HSO	Verification
Extra personal protective equipment	Project vehicle or support trailer	HSO	Verification
Communication equipment (operational)	Onsite	FTL	Daily radio check
Fire extinguishers[c]	In or near DWA or CWA	HSO	Monthly

a. This is verification that equipment is present at the designated project location – no inspection tag is required.

b. An eyewash bottle will be used to provide an immediate eye flush if required. The location of the eyewash station will be identified by the IH during the prejob briefing.

c. A minimum of one 10A/60BC extinguisher is required. If it is used, it will be returned for servicing and recharging.

CWA = controlled work area DWA = designated work area FTL = field team leader
HSO = health and safety officer IH = industrial hygienist

11.3 Emergency Communications

In the event of an emergency, the capability to summon INEEL emergency response resources to immediately notify site personnel and inform others of site emergencies is required. Communications equipment at the task site will be a combination of radios, telephones (e.g., mobile, cellular, or facility), and pagers. Communication methods described below will be used during emergency situations.

During emergency situations, the RWMC shift supervisor will be notified of any project emergency event. The RWMC shift supervisor will then make the required RWMC EC notification. The following information should be communicated, as available, to the shift supervisor:

Note: If the RWMC shift supervisor cannot be contacted then the WCC will be notified of the event and the information listed below communicated. The WCC must also be told that RWMC notification to the RWMC shift supervisor and EC has not been made.

- The caller's name, title (e.g., FTL or HSO), telephone number, and pager number
- Exact location of the emergency
- Nature of the emergency including time of occurrence, current site conditions, and special hazards in the area
- Injuries, if any, including numbers of injured, types of injuries, and conditions of injured
- Emergency response resources required (e.g., fire, HAZMAT, and ambulance)
- Additional information as requested.

11.4 Emergency Recognition and Prevention

All project personnel should be constantly alert for potential hazardous situations and signs and symptoms of chemical exposure or releases. All project personnel will be trained in proper site access and egress procedures in response to project events and INEEL emergencies as part of the project-specific training HASP. Visitors also will receive this training on a graded approach based on their access requirement. Alarm identification, location and use of communication equipment, location and use of site emergency equipment, and evacuation routes will be covered. Emergency phone numbers and evacuation route maps will be located in the project trailer. All field personnel should be familiar with the techniques for hazard recognition and assigned action levels.

11.5 Emergency Response Roles and Responsibilities

11.5.1 The Idaho National Engineering and Environmental Laboratory and Radioactive Waste Management Complex Emergency Response Organization

The INEEL ERO and RWMC ERO structures are based on the incident command system and are described in PLN-114, and Addendum 3 to that plan.

11.5.2 Project Personnel Involved in Emergencies

11.5.2.1 Field Team Leader. The FTL (or designated alternate) is responsible for initiating all requests for emergency services (e.g., fire and medical) and for notifying the RWMC shift supervisor of abnormal (or potential abnormal) events that may occur during the project. The FTL will also serve as the area warden (or designate that responsibility to another person who has been trained as area warden) and conduct personnel accountability. Personnel accountability will then be reported to the RWMC shift supervisor. Additionally, the FTL will control the scene until a higher tiered incident command system authority arrives at the scene to take control. When relinquishing this role, the FTL (or designated alternate) will provide all requested information about the nature of the event, potential hazards, and other information requested. The FTL may then be asked to report to the RWMC CP and serve in a technical support capacity.

11.5.2.2 Project Personnel. Every person at the routine monitoring site has a role to play during a project event or INEEL emergency. Each employee must be constantly aware of potential problems or unexpectedly hazardous situations by immediately reporting these situations to the FTL. All personnel are expected to watch out for their fellow workers, to report their concerns to the FTL, and to respond to emergency events as described in this HASP. Roles and responsibilities are further detailed in Table 11-2.

Table 11-2. Responsibilities during an emergency.

Responsible Person	Action Assigned
FTL (or designee)	Contact RWMC shift supervisor or Warning Communications Center and signal evacuation
FTL (or designee)	Conduct accountability and report to RWMC shift supervisor
FTL (or trained designee)	Serve as area warden
HSO and medic and first-aid trained personnel	Administer first aid to victims (voluntary basis only)
FTL (or designee)	Report spill to RWMC shift supervisor[a]
FTL (or designee)	Support the RWMC command post technical representative, as requested.

a. The environmental affairs spill response categorization and notification team will be contacted by the RWMC shift supervisor or emergency coordinator.

FTL = field team leader HSO = health and safety officer RWMC = Radioactive Waste Management Complex

11.5.3 Spills

The only likely potential for a liquid spill requiring reporting would be from equipment refueling tasks or broken equipment hydraulic lines. If the spills are small enough to be safely contained at the task site, task-site personnel will handle spill control using spill supplies at the site and immediately report the incident to the RWMC shift supervisor. The RWMC EC in accordance with MCP-190, "Event Investigation and Occurrence Reporting" will determine reporting requirements. If any release of a hazardous material occurs, task site personnel will comply with the following immediate spill response actions.

11.5.3.1 Untrained Initial Responder. The requirements for the untrained initial responder (or if the material characteristics are unknown) are listed below:

- Place equipment in a safe configuration
- **Evacuate** and **isolate** the immediate area
- Notify and then **seek help** from and **warn** others in the area
- **Notify** FTL.

11.5.3.2 Trained Responder. The requirements for the trained responder where material characteristics are known and no additional PPE is required are listed below:

- Place all equipment in a secure configuration
- **Seek help** from and **warn** others in the area
- **Stop** the spill if it can be done without risk (e.g., return the container to upright position, close valve, and shut off power)
- **Provide** pertinent information to the FTL
- **Secure** any release paths only in an emergency.

11.5.4 Alarms

Alarms and signals are used at the project site and the INEEL Site to notify personnel of abnormal conditions that require a specific response. Responses to these alarms are addressed in general employee training. In addition to the alarms previously described, emergency sirens located throughout the RWMC serve as the primary means for signaling emergency TAKE COVER or EVACUATION protective actions. To signal site personnel of a project-initiated emergency event, a separate set of emergency signals has been established based on horn blasts (e.g., vehicle). These signals are described in Table 11-3.

Table 11-3. Project internal emergency signals.

Device or Communication Method	Signal and Associated Response
Vehicle horn blasts	One long blast—Emergency evacuation, evacuate project site immediately. Proceed in an upwind direction to designated assembly area as specified by FTL. Two short blasts—Nonemergency evacuation of immediate work area. Proceed to designated assembly area as specified by FTL. Three long blasts or verbally communicated—All clear, return to project site.

11.5.4.1 Take Cover—Continuous Siren. Radiation or hazardous material releases, weather conditions, or other event or emergency conditions may require that all personnel take cover indoors in the nearest building. A TAKE COVER protective action may be initiated as part of a broader response to an emergency situation and may precede an evacuation order. The order to TAKE COVER is usually announced by activating the RWMC emergency siren. The signal to take cover is a CONTINUOUS SIREN that can be heard throughout the RWMC area. Remember, **STEADY = STAY**; however, the order to take cover can also be given by word of mouth, radio, or voice paging system. When ordered to TAKE COVER, project personnel will place the site in a safe condition (as appropriate) and then seek shelter in the project trailer or vehicle (if outside the RWMC facility). Eating, drinking, and smoking are not permitted during take-cover conditions.

11.5.4.2 Total Area Evacuation—Alternating Siren. A total area evacuation is the complete withdrawal of personnel from the project site and the entire RWMC area. The evacuation signal is an ALTERNATING SIREN that can be heard throughout the SDA. Remember, **ALTERNATE = EVACUATE**. A single long blast of the vehicle horn serves as the project's alternate emergency evacuation alarm; however, the order to evacuate can also be given by word of mouth, radio, or voice paging system. When ordered to EVACUATE, project personnel will place the site in a safe condition (as appropriate) and then proceed along the specified evacuation route to the designated assembly area or as directed by the EC.

For total area evacuations, the RWMC CP is activated and all personnel will gather at the primary RWMC evacuation assembly area or the location designated by the EC. The FTL or trained alternate will then complete the personnel accountability using the attendance log. In this situation, the project area warden reports the result of the accountability process to the RWMC EC.

11.5.4.3 Local Area Evacuation—Vehicle Horn Blast. A local area evacuation is the complete withdrawal of personnel from the project site, but it does not require the complete evacuation of the entire RWMC or INEEL area. A single long horn blast (vehicle) will serve as the project's primary emergency evacuation signal (as listed on Table 11-3); however, the order to evacuate can also be given by word of mouth, radio, or voice paging system. When ordered to evacuate the project site, personnel will place the site in a safe condition (as appropriate) and then proceed along the specified evacuation route to the assembly area designated for local area evacuations or as directed by the FTL. Eating, drinking, and smoking are not permitted during emergency evacuations.

11.5.5 Personnel Accountability and Area Warden

Project personnel are required to evacuate the site in response to TAKE COVER, EVACUATION, and local evacuation alarms. In each case, the FTL (or trained designee) will account for the people present on the site at the time the alarm was initiated. The FTL (or trained alternate) serves as the area warden for the project and completes the personnel accountability (following positive sweeps of the project site) based on the attendance log. The results of this accountability will then be communicated to the FTL for reporting to the RWMC shift supervisor or EC (if the CP has been formed).

11.5.6 Notifications

As directed by the office of the U.S. Secretary of Energy, the RWMC SAD is responsible for immediately notifying the DOE and local off-Site agencies of all significant abnormal events that occur at the RWMC. This duty is in addition to the notification requirements established in INEEL procedures for events that are categorized as emergencies or unusual occurrences. For this reason, the project will immediately report all abnormal events that occur on the project site to the RWMC shift supervisor and to the WCC. The WCC will in turn notify the appropriate INEEL emergency response resources and other

INEEL facilities as appropriate. The RWMC shift supervisor and the WCC share the responsibility for notifying the RWMC facility manager, EC, and area director (as appropriate). Normally the FTL is responsible for making the event notifications described above. Additional project notification may be made by the FTL. The EC is the single POC between the project and the INEEL ERO and off-Site personnel or agencies. The EC will make all off-Site notifications and respond to all media requests concerned.

11.5.7 Evacuation Assembly Areas and Central Facilities Area Medical Facility

The RWMC maintains primary and secondary evacuation assembly areas (see Figure 11-1). These routes may be used in response to a total RWMC area evacuation as directed by the EC. Copies of the evacuation assembly areas and the CFA-1612 medical facility route (see Figure 11-2) will be posted at the project site in the project administrative trailer.

11.6 Reentry and Recovery

11.6.1 Reentry

During an emergency response it is sometimes necessary to reenter the scene of the event. Reasons for performing a reentry may include:

- Personnel search and rescues
- Medical first-aid responses
- Safe shutdown actions
- Mitigating actions
- Evaluating and preparing damage reports
- Radiation or hazardous material surveys.

Reentries will be carefully planned to ensure that personnel are protected from harm and to prevent initiating another emergency event. Reentry planning is undertaken as a graded approach depending on the nature of the initiating event.

11.6.2 Recovery

After the initial corrective actions have been taken and effective control established, response efforts will shift toward recovery. Recovery is the process of assessing post-event and post-emergency conditions and developing a plan for returning to preevent and preemergency conditions, when possible, and following the plan to completion. The EC and emergency action manager are responsible for determining when an emergency situation is sufficiently stable to terminate the emergency and enter the recovery phase. The project manager, with concurrence from the RWMC SAD, will appoint the recovery manager.

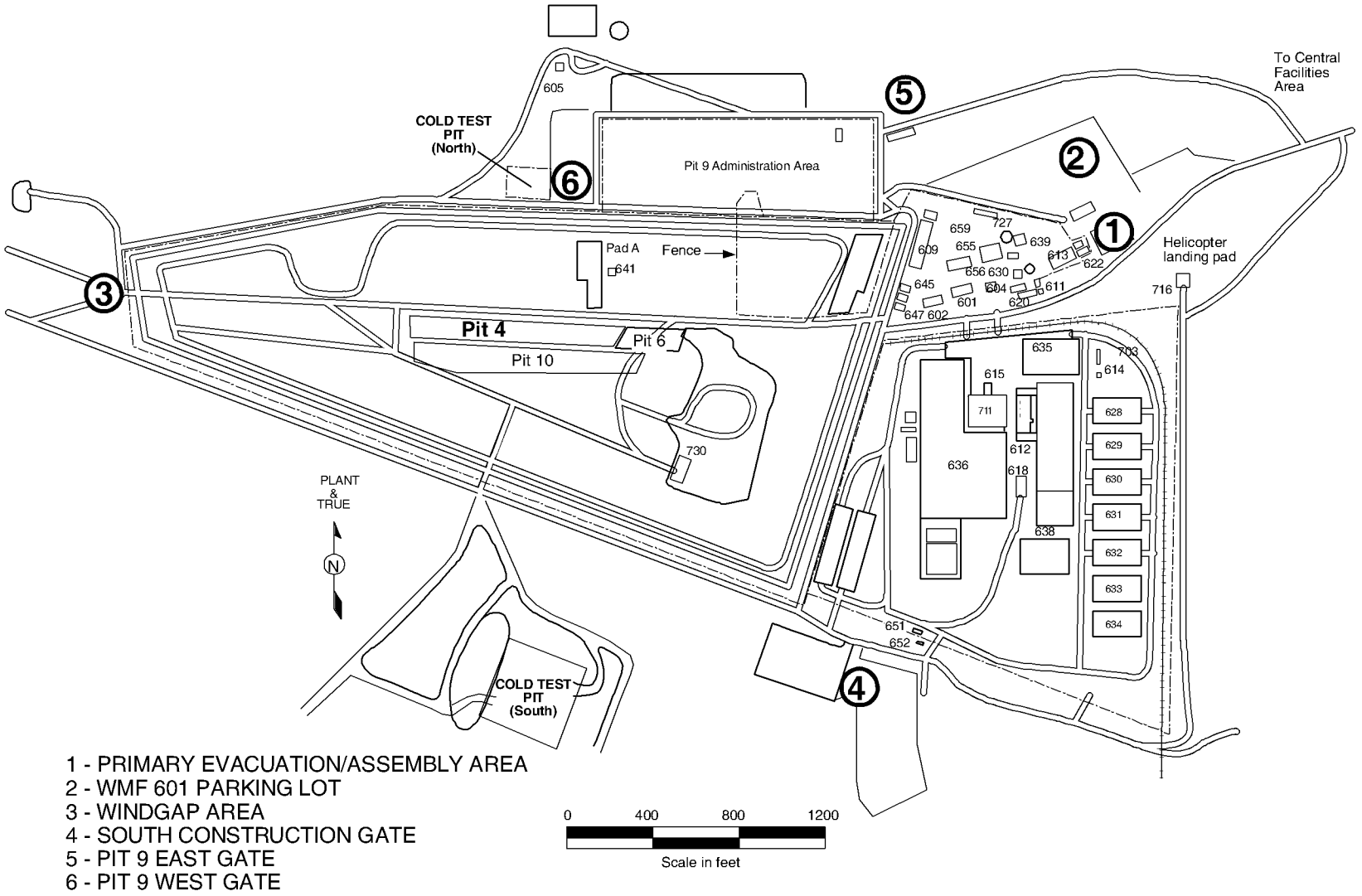

Figure 11-1. Radioactive Waste Management Complex primary and secondary evacuation assembly areas.

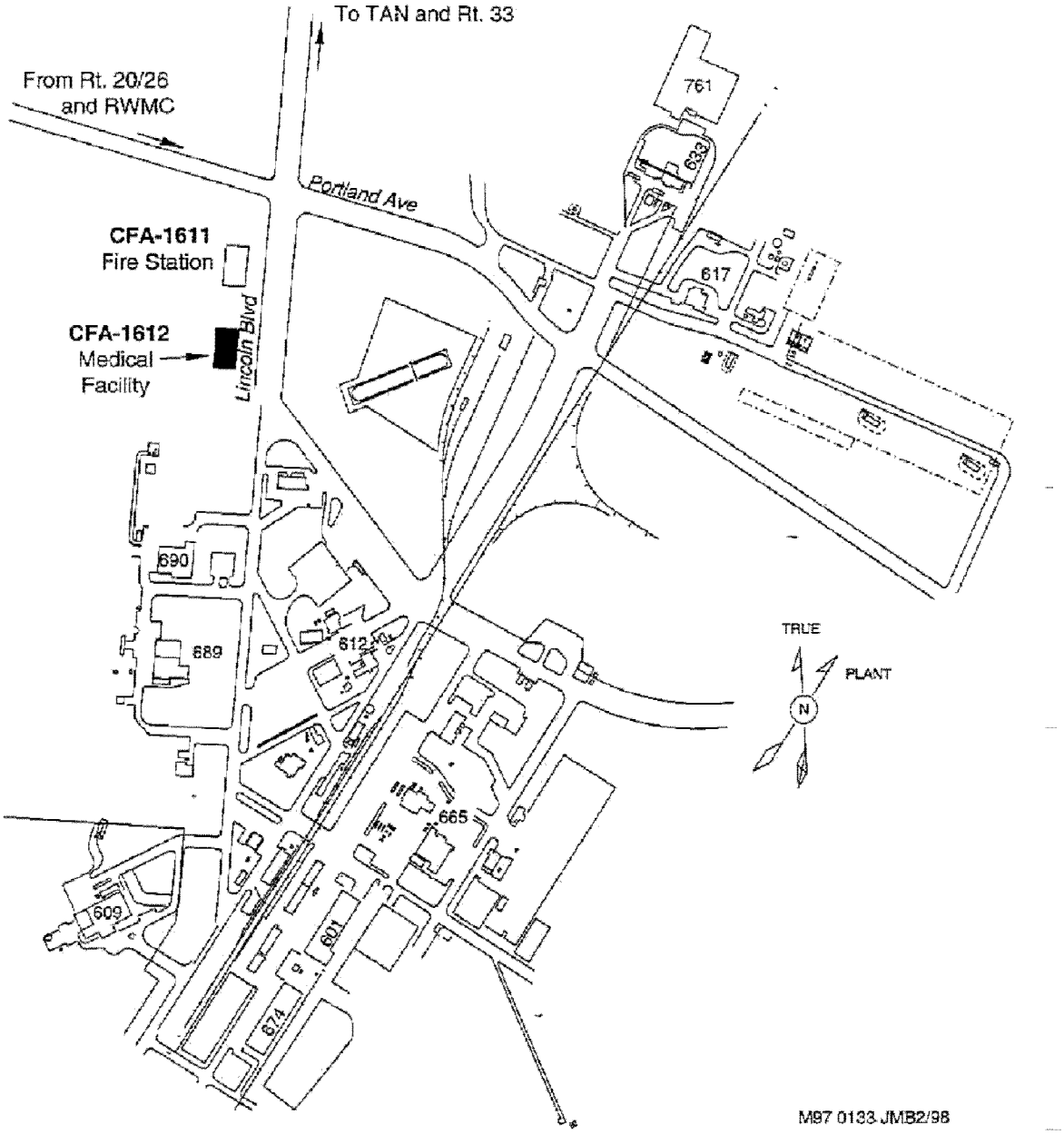

Figure 11-2. Map showing the route to the nearest medical facility (CFA-1612).

11.7 Critique of Response and Follow up

A review and critique will be conducted following all emergency events, drills, and exercises at the INEEL. In some cases an investigation may be required before commencing recovery actions. For this reason care should be exercised to preserve evidence when appropriate.

11.8 Telephone and Radio Contact Reference List

Table 11-4 lists the POCs for the project. This list will be posted at the entrance to the WAG 7 administrative trailer and in the FTL logbook. Because personnel listed may change frequently, working copies of this list will be generated as required to note new positions and personnel assigned. This HASP should not be revised with a document action request to note these changes.

Table 11-4. Project emergency contact list.

Contact Title	Contact Name	Phone Number/Radio Net	Pager Number/ Cell Phone
Fire, medical emergency, and security Warning Communications Center		777, 6-1515	
RWMC shift supervisor		6-2767	D-Net radio
Health and safety officer	Kelly A. Wooley	6-2552	7368
Safety professional	Kelly A. Wooley	6-2552	7368
Industrial hygienist	Brian Perkes	6-9358	6355
WAG 7 environmental compliance	Brent N. Burton	6-8695	7486
Clean/Close RWMC Project Director	John M. Schaffer	6-3029	520-5938
Field team leader	Sabin Hawley	6-1982	520-3106
RWMC Nuclear Facility Manager	Albert E. Millhouse	6-6932	520-5057
RWMC Operations Director	Scot Raisch	6-2431	
RWMC SH&QA manager	Randy D. Sayer	6-5706	5865
RWMC radiological control supervisor	Larry Barger	6-3742	521-0733
RWMC radiological engineer	W. Rick Horne	6-5318	5898

12. REFERENCES

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29 CFR 1910.134, 2001, *Code of Federal Regulations*, Title 29, "Labor," Part 1910, "Occupational Safety and Health Standards," Section .134, "Respiratory Protection," Office of the Federal Register.

29 CFR 1926.32, *Code of Federal Regulations*, Title 29, "Labor," Part 1926, "Safety and Health Regulations for Construction," Section .32, "Definitions," Office of the Federal Register.

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54 FR 29820, 1989, *Federal Register*, "National Priorities List for Uncontrolled Hazardous Waste Sites: Update #9, Federal Facilities Sites," FRL-3615-2, U.S. Environmental Protection Agency.

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